Narrative Report Routing Slip

Mr. Salyer _____ Mr. [illegible] _____

Mr. Crawford _____

Administrative Services

Miss Baum _____

Operations

Mr. [illegible] _____ Mr. Regan _____

Public Use

Mr. [illegible] _____ Mr. Kubichek _____

Mr. [illegible] _____

Resource Management

Dr. Morley _____ Mr. Hickok _____

Wildlife Management

Mr. [illegible] _____ Mr. Stiles _____

Mr. Goldman _____

Refuge DISTRICT No. 2, NORTH DAKOTA Period May - August 1961

NORTH DAKOTA EASEMENT REFUGES - DISTRICT #2

LAKE ARDOCH
BILLINGS LAKE
BUFFALO LAKE
BRUMBA LAKE
JOHNSON LAKE
KELLY SLOUGH
LAC AUX MORTES
LAMBS LAKE
LITTLE GOOSE
PLEASANT LAKE
ROCK LAKE
SNYDER LAKE
SIBLEY LAKE
SILVER LAKE
STUMP LAKE
WOOD LAKE MARSH

WEATHER AND WATER CONDITIONS. At the close of the period the easement district was in a very dry condition. Sub-soil as well as top-soil moisture was non-existant. Most lakes, large and small, were dry or nearly so. Devils Lake Weather Bureau records show that this was the second driest January to August period on record; the like period of 1917 receiving only .09 inches less precipitation. The North Dakota Game and Fish Department reports that at the time of their mid-July survey their water index was 91% below the 1960 index and 88% below the 1958-1960 average.

The large lakes of the area of major goose concentration in the vicinity of the City of Devils Lake were no exception to the drouth. The East Bay of Devils Lake, Dry Lake, Lake Irwin, Chain Lake, Mikes Lake and many lessor bodies of water were completely dry. Lake Alice was very shallow with water over only about 40% of the botton area. Crops were grown on the entire bottom of Lake Irwin, Mikes Lake and on part of Lake Alice, Chain Lake and Dry Lake. Most smaller water areas were also in crop.

Crops produced were phenominal! Seventy to eighty bushel barley, forty bushel wheat and thirty bushel flax were not uncommon with all of the best grade. The Ramsey County Agent reports that the bumper crop in Lake Irwin, which benefited only 5 farmers, depleted the soil moisture down 14½ inches. Surely this cropping will have some effect upon the filling of these lakes and the waterfowl food plants produced thereafter.

The value of the easement refuges continues to become more apparent each year as the prairies become dryer and the effects of the drouth become more acute. Due to their more stable and permanent water, economic use, which becomes more intense as the drouth is prolonged and receding water lines make available more land to be hayed and cultivated; does not affect them to as great a degree as those areas not quite as stable.

PRECIPITATION RECORDS DURING SELECTED GROWING SEASONS
OF THE 1905 - 1961 PERIOD

Month	Average 1905 - 1961	Dry Years				Some Recent Years				
		1910	1917	1934	1936	1952	1958	1959	1960	1961
January	.48	.10	.55	.55	.36	.76	.37	.34	.92	.35
February	.42	.27	.68	.10	.65	.16	.34	.66	.16	.62
March	.69	.34	.30	.43	.51	.70	.18	.12	.60	.14
April	1.26	1.22	1.40	.58	.44	.04	.66	.28	1.00	1.27
May	2.15	.91	1.69	.68	.65	.74	1.02	2.56	4.11	.83
June	3.35	1.33	Tr	3.59	2.13	2.92	3.36	2.83	2.34	.96
July	2.51	1.84	1.60	1.58	1.55	3.13	3.07	1.11	1.63	2.84
August	2.26	1.63	1.12	1.00	1.48	1.666	.80	1.70	3.16	.42
TOTAL	13.12	7.64	7.34	8.51	7.77	10.116	9.80	9.60	13.92	7.43

WATERFOWL. None of our easement refuges are dry although some are very low, all brought off good crops of young ducks and held sufficient water for the young to reach the flying stage. They undoubtedly sheltered many ducks that were hatched on other nearby areas now dry; for there were many reports of duck broods seen walking across country, leaving a drying pothole for one with a little more water. Many broods appeared on the south shore of Devils Lake and it is thought that they originated on pothole lakes that dryed during the early summer. In past years this highly alkaline water has attracted few waterfowl and hardly a brood. At the close of the period an estimated 60,000 ducks were using this lake in the area west of Fort Totten.

The large spring goose migration previously reported, extended into this period. Exceptionally large numbers again used Rock Lake, and some geese were there until the end of May. More geese "summered" in the district this year. Sixteen blue and snow geese stayed on Sweetwater Lake. One or two were also seen on Rock Lake Refuge, Silver Lake Refuge, Brumba Refuge, Billings Lake Refuge and on Lake Ardoch Refuge. A pair of common Canada geese and a pair of whistling swan also spent the summer on Lake Ardoch.

More black ducks were noticed than usual. Some were seen in mallard flocks on nearly all refuges. Groups of as many as 60 were seen. A brood of 8 or 9 black duck was noted at Lake Ardoch during the July 27 aerial count.

We are again enthused over the showing our easements are making in brood production, with total easement refuge production estimated at 8,416 ducks. Based on the aerial brood count there was an increase in production on 10 of 15 refuges.

A comparison of easement refuge aerial brood counts for past years can be seen in the accompanying table. The 1961 aerial brood count was again flown in the service aircraft by pilot-biologist Arthur Brazda and the refuge manager.

COMPARATIVE RECORD OF EASEMENT REFUGE BROOD COUNTS (aerial)

Refuge	1957	1959	1960	1961
Lake Ardoch	4	21	22	32
Billings Lake	7	6	21	22
Buffalo Lake	4	8	5	33
Brumba Lake	4	3	13	8
Johnson Lake	16	46	27	34
Kelly Slough	0	14	6	18
Lac aux Mortes	15	Dry	31	26
Lambs Lake	3	7	2	11
Little Goose	1	1	3	4
Pleasant Lake	5	11	12	9
Rock Lake	27	12	69	132
Snyder Lake	10	2	20	6
Sibley Lake	6	35	22	51
Silver Lake	0	9	13	17
Wood Lake Marsh	4	7	5	4
Totals	105	182	271	407

Using the 5 year hatching curve for all species; on the day the count was flown (July 27), 87% of the total brood production should have been hatched. Some of the early broods should have been flying and might not have been seen. Some of the broods were undoubtedly hidden and not out where they could be seen. Before we can estimate total production we must apply a correction factor to allow for the broods hatched but not seen. This will vary greatly from refuge to refuge, depending on emergent plant growth, water levels, etc; however, for the sake of unifority throughout the easement district and between production years, we have again assumed and used the figure of 40%.

$\frac{40}{100} :: \frac{407}{X}$ = 1017 broods = 87% of the total season hatch

HATCH. Since this 1017 broods is computed to be 87% of the total season hatch, then the total season hatch would be 1169 broods ($\frac{1017}{X} :: \frac{87}{100}$ = 1169) or 8,416 ducks (7.2 x 1169).

Production for the individual refuges (NR - 1B) was calculated in the same manner for the sake of uniformity, although obviously, due to lack of physical uniformity between refuges, production calculations for the district as a whole would be more accurate than those for a single refuge. Production trend would not be affected by this lack of physical refuge uniformity.

The 5 year average North Dakota brood size was used in computing productivity for uniformity and comparibility although our records indicate a downward trend in average brood size in 1961. An average brood size of 6.66 was computed from a sample of 125 broods in which the size was recorded. This sample is too small to be accurate enough to use in computing total easement district production, but possibly indicates a trend.

This increase in easement refuge waterfowl production was not varified by the ground brood count on the six sample areas. Total broods seen on these areas numbered 213 as compared to last years 218. However, you will recall that last years sample areas presented a very lopsided picture of the upward production trend since they were heavily weighted upward by 4 refuges that were blessed with abnormally good and unseasonable for the year, water conditions. We feel that this years ground brood count presents a better picture of the easement district as a whole and more accurately presents the long term trend than does last years count.

* 5 year average North Dakota average from Pitman Robertson Project report W-38-R-6.

COMPARATIVE RECORD OF EASEMENT REFUGE GROUND BROOD COUNT

(The same sampling routes and routines are followed each year although some refuges are covered more completely than others.)

Refuge	Per Cent Shoreline Covered	1957	1958	1959	1960	1961
Brumba	100	10	0	3	26	12
Johnson Lake	45	2	4	26	20	21
Rock Lake	50	7	3	9	118	133
Snyder Lake	50	0	3	2	48	13
Silver Lake	100	0	5	8	17	23
Wood Lake Marsh	40	0	2	4	9	11
		19	17	52	218	213

The species composition of the identified duck broods from the ground brood count as found in 1961 is compared to the 1960 brood count in the following table;

Brood Species	Per Cent of Total Identified Broods 1960	1961
Mallard	6.16	36.67
Gadwall	8.21	5.59
Baldpate	2.05	2.36
Pintail	19.86	16.95
Blue Winged Teal	19.86	24.31
Shoveler	18.54	8.86
Redhead	7.54	1.44
Canvasback	12.40	.73
Ring-neck	.68	.73
Ruddy	4.70	2.36
	100.00	100.00

As can be seen, the mallard production trend is significantly upwards while that of the redhead and canvasback is downward. We cannot offer an explanation for this loss in diver production for we felt we had divers in greater numbers using these refuges during the spring migration.

During banding operations in the vicinity of Sullys Hill it was noticed that on some of the formerly deeper water pothole lakes that were drying, the water line had receded beyond the normal contour line below which emergent vegetation grew. This condition forces broods to seek the open water of the center of the pool when danger approaches. It undoubtedly makes the brood more vulnerable to predation. It also affords easier visibility to the observer when trying to locate broods in census work on this type of lake. Only one of our easement refuges, Silver Lake, was affected in this manner during the production season and this might (i.e. the better visibility) account for some of the increase in the number of broods seen during the ground brood count on this refuge. Increased vulnerability of broods on dry land migrating from a drying area

would also probably account for greater predation, duckling loss, and smaller brood size. Brood size at Silver Lake averaged 6.2 (23 broods) or exactly the same as the state wide average as found by Orton and Fisher. Since our water areas attracted broods from nearby potholes as these areas dried, brood size on the easement refuges was undoubtedly, indirectly, influenced to some extent by both of the above mentioned factors.

Easement refuge brood size averaged 6.6. This was greater than the state wide average of 6.2 but less than the five year average of 7.2

Coot production was practically a total failure this year Four coot broods were noted during our ground count on the six sample areas. The result of this count as compared to 1960 can be seen in the table below.

Refuge	Number of Coot Broods 1960	1961
Brumba Lake	24	0
Johnson Lake	28	3
Rock Lake	60	0
Snyder Lake	30	1
Silver Lake	22	0
Wood Lake Marsh	3	0
	167	4

During the period a total of 476 locally produced ducks were banded. Most of these were trapped on Rock Lake Refuge, Indian Reservation potholes near Sullys Hill, and our Lone Tree Waterfowl Production Area. A summer employee, John W. Jones banded 103 blackbirds and 136 mourning doves.

A brood of black ducks was seen for the second consecutive year at Lake Ardoch during the aerial count. A brood of wood duck was also observed at this refuge. A pair of wood duck was seen at Wood Lake Marsh Refuge but no brood was noted there this year. A wood duck brood was observed there during the 1960 season.

Breeding pair counts were scheduled but due to unavoidable delays the service aircraft was not available until it was too late for satisfactory observations. Ground breeding pair counts were not made this year.

LAKE ARDOCH. Refuge water levels were held at or near approved level during the entire period. The lowest the pool reached was 6.10 during a period in late June and also during August, this was only 2 feet below the approved level for that time.

Pondweed stands appeared to be the best that the refuge manager has seen on this refuge. A brood of wood duck and a black duck brood were seen here during the July 27 aerial brood count. A pair of common Canada geese and a pair of whistling swan were also seen on this refuge at that time. The swan were observed on other occassions during the period.

The 32 broods seen here on the July 27 aerial count compares to last years 22 and would seem to indicate an increase in production as shown in NR-1B.

BILLINGS LAKE. At the close of the period the refuge water level was very low. About 20% of the bottom was exposed. The water level appeared to be at or slightly below the 23" depth recorded last fall at freeze up.

Broods seen (22) was about the same as in 1960 (21 broods) of which 5 and possibly 6 were divers.

BUFFALO LAKE. This lake again has a high water level. For the second consecutive year it filled to spillway level during spring when a late, local, snowstorm provided some run-off. This storm filled field potholes along the coulee to the north, attracting many breeding pairs. It is thought that this was the reason for the increased brood production on this refuge during the 1961 season. On July 26, when the aerial brood count was made, 33 broods were seen. Only 5 broods were observed here in 1960. Most of the broods seen this year were mallard, although two shoveler and one canvasback broods were identified.

BRUMBA LAKE. At the close of the period this lake was very shallow with 100' to 150' of shoreline exposed. Eight broods were recorded here during the aerial count which is down somewhat from the 13 broods seen in 1960. Twelve broods were noted on the 1961 ground brood count whereas 26 were seen in 1960.

JOHNSON LAKE. The level of the water in this lake is down considerably. By the end of July that portion of the refuge south of the county road was practically dry. During the period a group of National Guard personnel bivouaced on the west shore of the lake and built a road across it along the line between sections 30 & 31. This was unfortunate for it bisects the area of choicest diving duck nesting cover and disturbance here may cause a loss in duck production during future years. This road causway is shallow and could easily wash out should high water levels return, unless additional work is done on it.

Thirty-three duck broods were seen here during the 1961 aerial count. This was up somewhat from the 27 broods recorded in 1960.

KELLY SLOUGH. Although well watered at the begining, by the close of the period much of this refuge was dry and the level of the pool behind the old rubble masonry spillway was down ten inches. A highway rebuilding project on nearby U.S. #2 is the cause of this dry condition for contractors trucks have hauled much water from the upper end.

During the aerial brood count 1 brood was seen below the refuge, 18 broods on the refuge and 7 broods above the refuge. The eighteen broods on the refuge was a considerable increase over the six broods seen in 1960. On July 21, fourteen broods were noted from the ground. One of these was a redhead. Soil bank land in the north east corner was hayed in mid-July removeing some good 1962 nesting cover. In late August some stubble had been burned on the north west side of the refuge.

LAC AUX MORTES. With a spring maximum depth of only 25 inches and a dry summer the water in this refuge covered only about 40% of the bottom and was very shallow, at the close of the period. The refuge manager flew over this refuge on August 28, when he observed the above water condition and most of the remaining water did not appear to be over one or two inches deep. No evidence of botulism was noticed on this refuge during this past year.

A heavy crop of barley was taken off of the dry portion of the lake bottom near the Moen farm along the south east shore. Good crops were also taken off of the south part of Chain Lake and the marsh lands connecting Lac aux Mortes and Chain Lake. Due to the dry, early spring condition, no field potholes or marsh areas escaped the plow near here. During the period a brass capped elevation marker was set near the refuge outlet to be used as a reference point.

Swan and geese remained here during the first two weeks of May. We believe brood production to have been good although only 26 were seen during the aerial count. Heavy cover makes brood visibility very poor. Although we show a production figure of 538 ducks, based on the same formula as the other refuges, we feel that this is very low and probably only 20% of the actual figure. We did not notice a large concentration of moulting ducks here this year as has been the case in the past. Undoubtedly this was due to the shallow water condition. Ten little brown crane were seen here during our August 28, aerial inspection. Waterfowl useage was much lower for the period reflecting the dry condition of the refuge.

LAMBS LAKE. Following the drouth of this period this lake is the lowest this refuge manager has seen it. There is a lot of mud bottom showing and judging by appearances from the air on August 28, the

maximum depth could be no more than 10 inches. Eleven broods were seen here on July 11, which is much better than the two seen during the 1960 count. Observed waterfowl useage was better than for the corresponding period of 1960. During May there was some use by diving ducks but none was noted later in the period.

LITTLE GOOSE. This small refuge has deeper water than some and is not suffering for lack of it although the marshy area at the north end is dry. Four broods were seen here on July 27, when the aerial count was flown. Observed waterfowl useage was better than in 1960. Diving species used this refuge during the early part of May.

PLEASANT LAKE. Although low, the water level at this relatively shallow lake does not appear much worse than other years. Observed waterfowl use was greater during this period. Nine broods were seen during the aerial brood count. About 1500 moulting adults used this refuge this year. The stand of submerged acquatics appear to be much improved this year.

ROCK LAKE. At the close of the period the water level of this lake had dropped 19" from the spring level. It possessed a multitude of moulting ducks, principally pintail both on the refuge and more were seen on the area to the north of the refuge. One hundred thirty-two broods were counted on the refuge during the aerial survey and 78 broods off of the refuge to the north. A black duck brood was also noted at that time.

Submerged acquatics made an excellent growth here this year. Goose useage was high with large numbers remaining during all of May. Mr. Norheim reports seeing more geese on the refuge this year during late spring than during any other like period. A lone blue goose and a lone snow goose spent the summer here. A pair of sandhill cranes were first observed during mid-July and started rumors of wild turkey, etc. nesting in the area.

SNYDER LAKE. In 1961 as in 1959, both dry years, this refuge did not contribute too well towards duck production. This it can be assumed was due to the dry condition of the upper end and satelite areas which have the bulk of the nesting habitat. The lack of redhead and canvasback broods such as were found here in 1960 can possible be attributed to this. The lower end is deeper and steep sided with a rocky shoreline. There is also a public recreation area (swimming, boating, picknicking, "night frolics", etc.) at the lower end which causes much disturbance at times and limits waterfowl useage.

Only 6 broods were seen here during the July 27 aerial count. Twelve broods were seen on the July 22 ground count. It was at this time that one lone coot brood was also noted. Waterfowl useage of this refuge picked up in August when large numbers of mallards, gadwall, pintail, blue-winged teal and baldpate began using the upper end of the main lake and the pothole area below the dike.

SIBLEY LAKE. This refuge has experienced very high waterfowl useage and high production during the period. Waterfowl useage was much greater than in 1960. Fifty-one duck broods were seen during the aerial count along with 37 coot broods. This was the only refuge where any great amount of coot reproduction was noted. About 1500 ducks and 2000 coot moulted here.

The deepest portion of the lake is 14 inches and considerable mud bottom is showing around the edges.

SILVER LAKE. The level of this lake had dropped about 12" from the spring level of 42" maximum depth, by the end of the period. The sego pondweed beds produced a very good crop of seed. A good growth of emergent acquatics, sweetclover, etc., is extending itself out from the bank below the original, high water shore line. Seventeen broods were seen during the aerial count and 23 during the ground count. Grain crops in the vicinity of the refuge were better than in some areas and much better than in the vicinity of Sullys Hill.

WOOD LAKE MARSH. The level of the main impounded lake has had little change during the period. The pothole to the east of this lake that is within the refuge became dry. Fair waterfowl use was observed. Four broods were seen from the air and 11 seen during the ground count. A pair of wood duck was seen but unlike 1960, no wood duck brood was recorded.

Lands on the south-east side of the lake were not cultivated this year and the resultant field of weedy stubble made fine nesting cover.

STUMP LAKE. This refuge was not visited during the period. Due to its dry condition, it is doubtful that any bird useage was made of the refuge.

SIGNATURE PAGE

Submitted By:

John K. Bauman
(Signature)

Refuge Manager
(Title)

Date: September 20, 1961

Approved, Regional Office:

Date: 10-2-61

Ernest A. Epperson
(Signature)

Regional Refuge Supervisor

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Easement Refuges in District #2 MONTHS OF May TO August, 19 61

ESTIMATED WATERFOWL DAYS USE - EASEMENT REFUGES IN DISTRICT #2

(1) Species	(2) Weeks of - reporting period									
	Lake [illegible] 1	Billings Lake 2	Buffalo Lake 3	Brumba Lake 4	Johnson Lake 5	Kelly Slough 6	Lac aux Morts 7	Lambs Lake 8	Little Geese Lake 9	Pleasant Lake 10
Swans:										
Whistling	5000						1,800		200	
Trumpeter										
Geese:										
Canada	350	300					50			
Cackling										
Brant										
White-fronted	200		500				250		200	
Snow	200	250	30				15,000			
Blue	200						30,000			
Other										
Ducks:										
Mallard	82,800	4,400	5,200	9,600	24,000	18,000	66,000	10,000	3,000	24,000
Black	2,400	150		120	100	50	100	4,000		
Gadwall	3,950	1,200	4,200	2,400	6,600	1,800	16,000	500		6,000
Baldpate	4,000	850	800	8,000	4,800	1,500	13,000		750	
Pintail	14,400	5,000	2,000	4,250	12,000		16,000	4,800	2,900	30,000
Green-winged teal	1,500	250			250		500	250		
Blue-winged teal	18,600	4,500	3,500	2,500	8,500	19,500	13,000	4,400	700	2,000
Cinnamon teal										
Shoveler	3,500	1,500	1,600	850	7,200	500	13,000			2,000
Wood	450									
Redhead	6,900	3,250		200	6,600	950			300	
Ring-necked	5,000	2,200			50	50		800	120	
Canvasback	7,200		600	100	14,400	350		50	1,800	150
Scaup	30,000	1,300	1,200		25,000	400		3,000	2,000	
Goldeneye										
Bufflehead					1,150					
Ruddy	6,000	1,200			16,000	2,000				4,800
Other										
Coot	600	6,000	50	250	45,000	350	4,200	250		2,000

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Easement Refuges in District #2 MONTHS OF May TO August, 1961

(1) Species	(2) ESTIMATED WATERFOWL DAYS USE — Weeks of reporting period — EASEMENT REFUGES IN DISTRICT #2: Rock Lake 11	Snyder Lake 12	Sibley Lake 13	Silver Lake 14	Wood Lakes Marsh 15	Stump Lake 16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	5,000	200							12,200		
Trumpeter											
Geese:											
Canada	5,200	50							5,950		
Cackling											
Brant											
White-fronted	1,200								2,350		
Snow	160,000	1,200							176,680		
Blue	300,000	1,800		50					332,050		
Other											
Ducks:											
Mallard	52,000	6,200	28,000	19,800	3,600	NO			356,600		
Black	1,200	250							8,370		
Gadwall	2,000	800	7,200	6,000	1,200				59,850		
Baldpate	3,500	500	4,000	2,000					43,700		
Pintail	68,000	5,000	38,000	40,000	850				243,200		
Green-winged teal	500		500			WATERFOWL			3,700		
Blue-winged teal	54,000	5,000	25,000	37,000	600				198,800		
Cinnamon teal											
Shoveler	12,000	350	3,300	5,000	1,200				52,000		
Wood					200				650		
Redhead	2,600	550	4,800	1,250					27,400		
Ring-necked	1,200					USEAGE			9,420		
Canvasback	2,300	50	8,400	2,500	50				37,950		
Scaup	16,500		7,200	3,800	550				90,950		
Goldeneye											
Bufflehead									1,150		
Ruddy	2,000	250	4,800	25,000					62,050		
Other											
Coot:	2.400	500	125.000	22.000							

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	~~12,200~~		
Geese	~~517,030~~		
Ducks	~~1,148,970~~		~~8,416~~
Coots	~~208,600~~		~~200~~

SUMMARY

Principal feeding areas

Principal nesting areas

Reported by John K. Bauman

John K. Bauman

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

61

Refuge Easement Refuges in District #2 For 12-month period ending August 31, 19__

Reported by John K. Bauman Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
	Crops		Ducks			
LAKE	Upland	821	Geese	377,730		662
ARDOCH	Marsh	612	Swans			
REFUGE	Water		Coots	41,895		
	Total	600	Total	15,950		
		650		18,350		
	Crops	2676	Ducks	453,925		
	Upland		Geese			
BILLINGS	Marsh	330	Swans	61,065		455
LAKE	Water	190	Coots	9,670		
REFUGE	Total	160	Total	5,500		
		80		36,650		
	Crops	760	Ducks	132,885		
	Upland		Geese			
	Marsh	403	Swans	52,350		683
BUFFALO	Water	1262	Coots	1,200		
LAKE	Total	90	Total	400		
REFUGE		336		6,550		
	Crops	2091	Ducks	60,500		
	Upland		Geese			
	Marsh	1281	Swans	36,390		166
BRUMBA	Water	500	Coots	4,400		
LAKE	Total	60	Total	1,100		
REFUGE		136		3,250		
	Crops	1977	Ducks	45,140		
	Upland		Geese			
	Marsh	80	Swans	237,000		703
JOHNSON	Water	1006	Coots	12,795		
LAKE	Total	197	Total	11,050		
REFUGE		681		88,300		
	Crops	2007	Ducks	349,145		
	Upland		Geese			
KELLY	Marsh	385	Swans	77,180		372
SLOUGH	Water	295	Coots	850		
REFUGE	Total	665	Total	150		
		280		2,450		
	Crops	1625	Ducks	80,630		
	Upland		Geese			
	Marsh	1800	Swans	1,470,200		538
LAC AUX	Water	281	Coots	602,300		
MORTES	Total	2000	Total	9,600		
REFUGE		1800		20,050		
		5881		2,102,150		

(over)

INSTRUCTIONS

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(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) Habitat:

Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.

(5) Production: Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Easement Refuges in District #2 For 12-month period ending August 31, 19__

Reported by John K. Bauman Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage	(3)	(3) Use-days	(4) Breeding Population	(5) Production
LAMBS LAKE REFUGE	Crops	150	Ducks	52,760		228
	Upland	30	Geese	25,730		
	Marsh	110	Swans	1,750		
	Water	50	Coots	2,650		
	Total	340	Total	84,890		
LITTLE GOOSE REFUGE	Crops	266	Ducks	21,150		83
	Upland	100	Geese	1,110		
	Marsh	4	Swans	600		
	Water	30	Coots	1,500		
	Total	400	Total	24,460		
PLEASANT LAKE REFUGE	Crops	88	Ducks	101,055		186
	Upland	390	Geese	-		
	Marsh	200	Swans	-		
	Water	287	Coots	2,950		
	Total	965	Total	104,005		
ROCK LAKE REFUGE	Crops	1285	Ducks	518,125		2731
	Upland	1325	Geese	483,350		
	Marsh	15	Swans	500		
	Water	615	Coots	62,400		
	Total	3240	Total	1,064,375		
SNYDER LAKE REFUGE	Crops	373	Ducks	99,375		88
	Upland	942	Geese	4,450		
	Marsh	27	Swans	200		
	Water	208	Coots	11,300		
	Total	1550	Total	115,325		
SIDLEY LAKE REFUGE	Crops	370	Ducks	260,130		1055
	Upland	277	Geese	150		
	Marsh	200	Swans	-		
	Water	240	Coots	165,500		
	Total	1087	Total	425,780		
SILVER LAKE REFUGE	Crops	1525	Ducks	231,450		352
	Upland	991	Geese	85,650		
	Marsh	173	Swans	6,650		
	Water	348	Coots	53,300		
	Total	3037	Total	377,050		

(over)

INSTRUCTIONS

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(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

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Interior Duplicating Section, Washington, D. C. 27580

3-1750
Form NR-1B
(December 1956)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Easement Refuges in District #2 For 12-month period ending August 31, 19__

Reported by John K. Bauman Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
WOOD LAKE MARSH REFUGE	Crops	110	Ducks	11,710		83
	Upland	180	Geese			
	Marsh	25	Swans			
	Water	85	Coots	550		
	Total	400	Total	12,260		
STUMP LAKE REFUGE	Crops		Ducks	No Useage		None
	Upland	27.39	Geese	No Useage		
	Marsh		Swans	No Useage		
	Water		Coots	No Useage		
	Total		Total			
GRAND TOTAL OF ALL REFUGES	Crops	9260	Ducks	3,627,670		8,416
	Upland	8408.39	Geese	1,273,570		
	Marsh	1626	Swans	55,530		
	Water	5769	Coots	475,750		
	Total	28063.39	Total	5,432,520		
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

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Interior Duplicating Section, Washington, D. C.
1956